

## Study Guide

## Key Concepts

## 9.1 Naming Ions

- When the metals in Groups 1A, 2A, and 3A lose electrons, they form cations with positive charges equal to their group number.
- The charge of any ion of a Group A nonmetal is determined by subtracting 8 from the group number.
- The charges of cations of many transition metal ions must be determined from the number of electrons lost. When a cation can have more than one ionic charge, a Roman numeral is used in the name to indicate the charge.
- The names of most polyatomic anions end in *-ite* or *-ate*.

## 9.2 Naming and Writing Formulas for Ionic Compounds

- The name of a binary ionic compound is the cation name followed by the anion name.
- To write the formula for a binary ionic compound, write the symbol for the cation and then the anion. Then balance the charges.
- To write formulas for compounds containing polyatomic ions, write the symbol for the metal ion followed by the formula for the polyatomic ion and balance the charges.
- To name a compound containing a polyatomic ion, state the cation first and then the anion.

## 9.3 Naming and Writing Formulas for Molecular Compounds

- Prefixes show how many atoms of each element are present in a molecule of a binary compound.
- To write the formula for a binary molecular compound, write the symbols for the elements and use the prefixes to determine the subscripts. Omit *mono-* for a single atom.

## 9.4 Naming and Writing Formulas for Acids and Bases

- An acid is a combination of a monatomic or polyatomic anion with sufficient hydrogen atoms to make the compound electrically neutral. Acids are named as shown in Table 9.5.
- A base is a combination of a cation with as many hydroxide ions as are needed to make the compound electrically neutral. Bases are named in the same way as other ionic compounds.

**C** Hydrates: compounds that decompose at relatively low temperatures to produce water and an associated compound (usually ionic). Naming hydrates: name the ionic compound and then the number of water molecules. Anhydrous material: water is removed from the hydrate.

## Vocabulary

- |                            |                      |                           |
|----------------------------|----------------------|---------------------------|
| • acid (p. 271)            | • Lavoisier (p. 260) | • monatomic ion (p. 253)  |
| • base (p. 273)            | • ionic (p. 268)     | • polyatomic ion (p. 257) |
| • binary compound (p. 261) | • Molecular (p. 268) |                           |

**Properties of:** Molecular compounds, ionic compounds, acids and bases.

**States:** Acid: aqueous (aq)  
 Base: study notes  
 solid (s) Molecular: solid (s), liquid (l) or gas (g)